

Claims in Application Serial No. 10/858,656

1. An apparatus comprising:
 - a diesel engine having an exhaust outlet in communication with an exhaust pipe along an exhaust conduit;
 - a catalyzed filter in communication with the exhaust outlet, the catalyzed filter comprising a first catalyst comprising a first catalyst composition which comprises:
 - a first platinum group metal; and
 - a first cerium component; and
 - a second catalyst in communication with the first catalyst, at least a portion of the second catalyst located at a separate location along the exhaust conduit selected from the group consisting of between the engine exhaust outlet and the first catalyst, and between the first catalyst and the exhaust pipe, the second catalyst comprising a second catalyst composition which comprises:
 - a second cerium component.
4. The apparatus as recited in claim 1 wherein the second catalyst is located between the engine outlet and the first catalyst.
5. The apparatus as recited in claim 4 wherein the second catalyst is supported on a separate substrate than the catalyzed filter.
6. The apparatus as recited in claim 4 wherein the second catalyst is located at the catalyzed filter.
7. The apparatus as recited in claim 6 wherein the catalyzed filter has an axial length extending from an upstream filter end to a downstream filter end, and the second catalyst is located for at least part of the axial length from the upstream end.
8. The apparatus as recited in claim 7 wherein the second catalyst extends for from about 0.25 to about 8 inches from the upstream end.
9. The apparatus as recited in claim 8 wherein the second catalyst extends for from about 0.5 to about 5 inches from the upstream end.

11. The apparatus as recited in claim 1 wherein the second catalyst is located between the engine outlet and the catalyzed filter.
12. The apparatus as recited in claim 1 wherein the second catalyst is located downstream of the first catalyst.
13. The apparatus as recited in claim 12 wherein the second catalyst is supported on a separate substrate than the catalyzed filter.
14. The apparatus as recited in claim 12 wherein the second catalyst is located at the catalyzed filter.
15. The apparatus as recited in claim 14 wherein the catalyzed filter has an axial length extending from an upstream filter end to a downstream filter end, and the second catalyst is located for at least part of the axial length from the upstream end.
16. The apparatus as recited in claim 15 wherein the second catalyst extends from about 0.25 to about 8 inches from the upstream end.
17. The apparatus as recited in claim 16 wherein the second catalyst extends from about 0.5 to about 5 inches from the upstream end.
18. The apparatus as recited in claim 1 wherein the second catalyst is located downstream of the catalyzed filter.
19. The apparatus as recited in claim 1 wherein the first catalyst further comprises a first zirconium component.
20. The apparatus as recited in claim 1 wherein the second catalyst composition further comprises a second metal oxide selected from silica, alumina, titania, zirconia, silica-alumina and ceria-zirconia.
22. The apparatus as recited in claim 20 wherein the second cerium component is bulk ceria having a BET surface area of at least about $10 \text{ m}^2/\text{g}$ and the second metal oxide is a bulk metal oxide having a BET surface area of at least about $10 \text{ m}^2/\text{g}$.
23. The apparatus as recited in claim 22 wherein the second catalyst composition comprises the second cerium component, which comprises ceria, and the second metal oxide in a weight ratio of from 5:95 to 95:5.

24. The apparatus as recited in claim 22 wherein the second catalyst comprises at least one second platinum group metal component.
25. The apparatus as recited in claim 24 wherein the second platinum group metal component is selected from platinum, palladium, and rhodium components.
26. The apparatus as recited in claim 25 wherein the second platinum group metal components is present in an amount of from 0.1 to 200 g/ft³ based on the weight of the metal.
27. The apparatus as recited in claim 26 wherein the second platinum group metal component is a platinum component in an amount from 0.1 to 15 g/ft³ based on the weight of the metal.
28. The apparatus as recited in claim 27 wherein the second platinum group metal component is in an amount from 0.1 to 5 g/ft³ based on the weight of the metal.
29. The apparatus as recited in claim 26 wherein the second platinum group metal component is a second platinum component in an amount from 0.1 to 0.5 g/ft³ based on the weight of the metal.
30. The apparatus as recited in claim 1 wherein the first catalyst composition further comprises a first metal oxide selected from silica, alumina, titania, zirconia, and silica-alumina.
32. The apparatus as recited in claim 30 wherein the first cerium component is bulk ceria having a BET surface area of at least about 10 m²/g and the first metal oxide is a bulk metal oxide having a BET surface area of at least about 10 m²/g.
33. The apparatus as recited in claim 32 wherein the first catalyst composition comprises the first cerium component, which comprises ceria, and the first metal oxide in a weight ratio of from 5:95 to 95:5.
34. The apparatus as recited in claim 30 wherein the second catalyst composition comprises a second platinum group component which is selected from platinum, palladium, and rhodium components.

35. The apparatus as recited in claim 34 wherein the second platinum group metal components is present in an amount of from 0.1 to 200 g/ft³ based on the weight of the metal.

36. The apparatus as recited in claim 1 wherein the catalyzed filter comprises a wall flow honeycomb substrate.

37. The apparatus as recited in claim 1 wherein the second catalyst is supported on a flow through honeycomb substrate.

41. The apparatus as recited in claim 24 wherein the second platinum group component metal component comprises platinum in an amount of from 0 to 25 g/ft³.

42. The apparatus as recited in claim 1 wherein the first cerium component comprises ceria-zirconia.